Before the
Federal Communications Commission
Washington, D.C. 20554

GEN. Docket No. 87-112

In the Matter of

Development and Implementation
of a Public Safety National Plan
and Amendment of Part 90
to Establish Service Rules
and Technical Standards for Use
of the 821-824/866-869 MHz Bands
by the Public Safety Services.

## REPORT AND ORDER

Adopted: November 24, 1987; Released: December 18, 1987

By the Commission: Commissioner Dawson not participating; Commissioner Quello concurring in the result and issuing a separate statement.

## I. INTRODUCTION

1. By this action, the Commission adopts policies, procedures and rules that constitute a national plan for public safety services (National Plan). In particular, the Commission is adopting service rules and technical standards for the 821-824/866-869 MHz bands, which the Commission allocated for public safety use in an order adopted July 24, 1986.[1] This National Plan, which we developed in response to a Congressional directive,[2] will ensure that the new channels are used effectively and efficiently for important public safety functions such as crime control, firefighting, and emergency medical services.

2. Adequate mobile communication for agencies charged with protecting the public welfare is of critical importance to the overall well- being of this nation. Every person in the country is dependent directly or indirectly on the myriad services provided by public safety and emergency medical entities. These services include such things as crime control and prevention, dispatching ambulances, coordinating highway crews during weather or traffic emergencies, firefighting and prevention, and detecting and controlling fires in the almost one-half billion acres of non-federal forests. Two-way radio provides a vital component in this nation's public safety and emergency medical infrastructure. Agencies involved in the protection of life and property are able to do their jobs effectively and efficiently only by making extensive use of a wide array of mobile communications options available to them. Full use of these options requires that adequate spectrum be made available and that its use be well planned and coordinated to assure that the diverse needs of public safety entities can be satisfied. To this end, the Commission has allocated 6 megahertz of spectrum for these services and is adopting this National Plan to assure that adequate and appropriate frequencies are available to those who serve and protect our way of life.

3. As the Commission stated in its *Notice of Proposed Rule Making* in this proceeding, we have two broad objectives in developing this National Plan. First, we intend to facilitate *interoperability* between communications systems to permit local, state, and federal agencies to coordinate their activities. Second, we intend to ensure *efficient use of the spectrum allocated for public safety.* [3]

4. In this *Report and Order*, we set national guidelines for use of the spectrum while allowing regional public safety planning committees to develop regional plans tailored to their areas§ own particular communications needs.[4] It is the Commission's belief that while certain technical concerns must be addressed at the national level, the great diversity of needs in different areas of the country demand that input also be obtained at the state and local levels. Therefore, the National Plan, while focusing on general spectrum allocation issues, also provides a framework for regional planning. In this way, the Plan provides overall guidance on the use of new spectrum by the public safety services and also serves as an umbrella for the development of regional public safety plans. These plans will be prepared by regional planning committees, under the general oversight of the Commission, and will address the unique spectrum allocation requirements of the public safety and governmental authorities of the regions. By using the two-pronged approach of regional as well as national planning, we will satisfy the Commission's responsibility to provide spectrum for all of the country's public safety and special emergency entities, while also providing sufficient flexibility to allow regional planners to develop efficient and effective solutions to local public safety problems.

## II. BACKGROUND

5. In December 1983, the United States Congress directed the Commission to establish a plan to ensure that the communications needs of state and local public safety authorities would be met. Congress specified that the Commission should: (1) review current and future needs of public safety authorities, and (2) consider the need for a nationwide frequency allocation. *Authorization Act, supra* note 2, § 9(a).

6. In a *Notice of Inquiry* issued on March 7, 1984, the Commission solicited comments from the public safety community and other interested parties on many issues, including present and future public safety communications needs, the utility of new technologies to public safety applications, and coordination of federal, state, and local communications concerns.[5] We received and evaluated almost 300 comments in response. These comments formed the basis for the *Staff Report* issued by the Commission's Private Radio Bureau (the Bureau) on August 1, 1985.[6] In its *Staff Report* the Bureau identified the communications needs of public safety authorities and suggested options to meet those needs. One option the Bureau identified was the allocation of additional frequencies at 821-825 MHz and 866-870 MHz for public safety use nationwide.[7]

7. On September 19, 1986, the Commission issued the *Allocation Order* allocating 6 megahertz of spectrum for public safety use. *Allocation Order, supra* note 1, 2 FCC Rcd at 1838, para. 99. The Commission selected the 821-824 MHz and 866-869 MHz bands because they were adjacent to frequencies already used for public safety purposes, thereby providing for expansion of, or interoperability with, existing public safety communications systems

already licensed in the 806-821/851-866 MHz bands.[8] In order to be certain that the newly allocated frequencies would be used efficiently, we specified that the frequencies could not be used until we had adopted a National Plan for public safety spectrum utilization. We noted the importance of public participation in development of the plan and stated our intention to seek guidance from the public safety community and other interested members of the public. *Id.* at 1838, para. 99.

8. In December 1986, the Commission established the National Public Safety Planning Advisory Committee (NPSPAC or Committee) to involve parties interested in public safety in the planning effort. *Notice* at 2869, para. 3. NPSPAC had open membership, and all interested parties were invited to participate in its meetings. We directed NPSPAC to:

> (a) identify communications requirements of public safety services; (b) develop a scheme for efficient use of the new frequencies; (c) develop a scheme to increase utility of existing public safety frequencies; (d) recommend the manner in which new technologies can be applied to public safety frequencies; and (e) recommend guidelines to ensure compliance with the National Plan.[9]

NPSPAC issued its Initial Report to the Commission in March 1987.[10] In this report, NPSPAC discussed a wide variety of topics in three general categories: developing regional plans, use of the allocated frequencies, and meeting technical requirements.

9. On May 15, 1987, the Commission issued a *Notice of Proposed Rule Making* proposing policies and rules for the National Plan. *Notice of Proposed Rule Making*, Gen. Docket No. 87-112, 2 FCC Rcd 2869 (1987) (*Notice*). The *Notice* envisioned the National Plan as an overall spectrum management approach consisting of policy guidelines, technical standards, and procedures to satisfy public safety communications needs for the foreseeable future.

10. The Commission proposed a structure for the National Plan that consisted of both national and regional planning aspects. Under the proposal, the United States would be divided into regions. The regions would have as much autonomy as possible, within the framework of the National Plan, to develop regional plans that meet their different communications needs. *Notice*, 2 FCC Rcd at 2870, para. 7. The *Notice* identified certain common national requirements. Specifically, the *Notice* identified requirements pertaining to intercommunication channels, a channeling plan, use of trunking, return of unused frequencies, and technical standards to control interference. Plans were to be developed for each region by the public safety entities in those regions. The regional plans were to focus on the spectrum requirements of all these entities and determine how the available spectrum could best be used to satisfy these requirements. The Commission asked for public comment on the policies proposed in the *Notice* and on NPSPAC's *Initial Report*, which we attached as an Appendix to the *Notice*. In September 1987, NPSPAC submitted its *Final Report* to the Commission.[11] The Commission issued a public notice soliciting comment on NPSPAC's *Final Report*.[12]

## III. STRUCTURE OF THE NATIONAL PLAN

### A. *Description*

11. In the *Notice* we indicated that the National Plan would establish common elements and guidelines for the development of regional plans. *Notice*, 2 FCC Rcd at 2870, para. 8. Regions were to be left free to identify specific users and their spectrum requirements. The purpose of this dichotomy between the National Plan and the regional plans is to balance our primary regulatory objectives of maximizing spectrum efficiency and ensuring that the system has sufficient flexibility to accommodate the wide variety of specific communication requirements in different areas of the country. Thus, as stated in the *Notice*, the National Plan serves as an umbrella over the regional plans.

### B. *Eligibility*

12. Our *Notice* proposed to make "public safety authorities," defined as entities licensed in the Public Safety Radio Services and the Special Emergency Radio Service (SERS), eligible to operate in the new public safety bands, 821-824/866-869 MHz. *Notice*, 2 FCC Rcd at 2869, para. 6.[13] Several public safety agencies argued that in the major metropolitan areas, where demand for spectrum is heavy, SERS eligibles should be excluded from this spectrum. They maintained that in some areas the Public Safety Radio Services will require the entire available spectrum and that these requirements should be given priority over the SERS. *See , e. g.*, Comments of Los Angeles Police Department at 2. Other commenters argued that regional planning groups should have the latitude to include certain SERS eligibles, depending on the availability of spectrum and the public safety role of each SERS eligible in that region. *See , e. g.*, Joint Comments of Port Authority of New York and New Jersey and New York Metropolitan Area Committee for Public Spectrum Relief at 4. SERS proponents argue that they play an integral role in public safety and should be made eligible. *See , e. g.*, Reply Comments of American Hospital Association at 2.

13. The Public Safety Radio Services and the Special Emergency Radio Service are both involved with public safety. There are, however, many types of eligible entities within each of these two broad service categories. The various eligible entities within these categories have different roles and responsibilities in public safety that vary from one region to the next. For example, school buses, which are eligible under the SERS, are included in emergency evacuation plans in some areas and not in others. Similarly, the Forestry-Conservation Radio Service, which is included in the Public Safety Radio Services, may have a limited role in public safety in metropolitan areas like New York City. Since both the Public Safety Radio Services and the SERS play important roles in public safety in many areas, we continue to believe it necessary to make both services eligible to operate in the 821-824/866-869 MHz bands. We recognize, however, that in some regions it may not be possible to grant requests for assignments in the new 800 MHz spectrum to everyone who is eligible. In such cases, the highest priority must be given to those organizations most fundamentally involved in protection of life and property. We believe that regional planning committees are in the best position to determine which services are of the greatest importance to public safety in their regions. Therefore, we will leave it to the regional

mmittees to make such determinations as needed in veloping regional plans. Where regional plans do not commodate all eligible entities, we will require an exination of the criteria used to determine which eligible tities are to be given assignments. *See* para. 51, *infra*.

C. *Common Elements of Regional Plans*

14. To ensure that the National Plan encourages the ost efficient utilization of the available spectrum and sters interoperability between users, it is necessary to ablish minimal technical standards for the regional ans.

1. *Channeling Plan*

15. The *Notice* proposed a 12.5 kHz channeling plan for e new 800 MHz public safety bands.[14] *Notice*, 2 FCC cd at 2871, para. 15. This proposal was consistent with e channeling plan adopted for the new private land obile radio spectrum at 900 MHz. *Allocation Order*, 2 CC Rcd at 1835, para. 74. To satisfy public safety's owing need for specialized transmissions such as high eed data transmission and encryption techniques, which nerally require more than 12.5 kHz of bandwidth, and foster compatibility with existing public safety operons in the 806-821/851-866 MHz bands, which use 25 Hz channels, the *Notice* proposed to permit the stacking two 12.5 kHz channels to form one 25 kHz channel. ne *Notice* stated that this approach would encourage ectrum-efficient technology without precluding system mpatibility with existing equipment, digital transmisons, or other specialized technologies. *Notice*, 2 FCC Rcd 2871, para. 15.

16. NPSPAC's *Final Report* stated that the channeling an for the new spectrum should satisfy a variety of rrent and future public safety needs including: (1) inroperability among users of the new allocation and those the lower adjacent band; (2) interoperability on comon mutual aid channels; (3) the capability for expansion modification of systems in either band; (4) the capabilfor voice encryption; (5) the capability for high speed gital data transmission; and (6) the increasing demand r federal, state, and local interagency communications of oth inter- and intra- discipline modes. *Final Report*, *supra* ote 11, at 13. In order to satisfy these needs, the *Final eport* recommended a channeling plan based on 25 kHz annels spaced every 12.5 kHz, commonly referred to as offset plan.[15]

17. NPSPAC stated that compatibility between existing nd new equipment would be poor under the Commison's proposal because of the different bandwidths. Dual ndwidth equipment would be more costly, and no such quipment currently exists, according to NPSPAC. The ommittee asserted that no commercially available high curity digital voice encryption products will operate efctively at 12.5 kHz channel bandwidths. Further, PSPAC indicated that many current digital data transission techniques require 25 kHz bandwidth. A 12.5 kHz ndwidth would both exclude some current products, and mit future high speed digital applications, according to ne Committee. *Final Report* at 15.

18. Based on the results of various independent studies, PSPAC concluded that the 25 kHz offset plan is nearly spectrum efficient as the Commission's 12.5 kHz plan. *inal Report* at 15-17. In particular, NPSPAC cited a omputer analysis of channel assignments in the Dallas/Fort Worth area that Motorola, Inc. performed.[16] Because of adjacent channel protection requirements, a 12.5 kHz channelization plan would not yield twice as many channels as a 25 kHz channelization plan in any geographic area. The analysis showed that the spectrum efficiency of 25 kHz offset assignments is approxi- mately ninety percent of that of 12.5 kHz assignments. Therefore, NPSPAC argued that the Commission's proposed 12.5 kHz channeling plan would offer no significant improvement in spectrum utilization efficiency over the recom- mended 25 kHz offset plan. *Final Report* at 16-17.

19. Public safety interests strongly endorsed NPSPAC's recommendation. In particular, many commenters emphasized that lack of compatibility would impede their ability to expand existing systems. *See e. g.*, Comments of Connecticut Department of Public Safety to *Notice* at 5. They argued that the requirements of the public safety services are different from the requirements of users of the 896-901/935-940 MHz private land mobile band, where the predominant requirement is voice communications, there is minimal need for interoperability with existing systems, and there is little demand for encryption. Comments of General Electric Company at 5. These commenters noted that the Commission allocated the 821-824/866-869 MHz spectrum to public safety largely because of its adjacency to existing public safety spectrum. They argued that adopting a different channeling scheme for the two bands would remove the possibility of expanding existing systems. In addition, the Los Angeles Police Department stated that the split channel plan would "prohibit interoperability with existing systems [operating in the 806- 821/851-866 MHz bands], seriously complicate encryption potential, render existing equipment unusable, and force an unproven technology on the public safety community." Comments of the Los Angeles Police Department at 2. Motorola also argued that a channel plan that would properly align the center frequencies of the old and new channels to permit interoperable communications would overlap three 12.5 kHz channels. Comments of Motorola at 6.

20. Many commenters attempted to show that the offset plan and related technical enhancements would create a number of usable channels approaching that of the split channel plan. For example, Omnicom, Inc. conducted a detailed technical analysis and, after accounting for the nationwide mutual aid channels, mobile digital terminals, and digital encryption, concluded that the proposed split channel option provides no significant improvement in spectrum efficiency over the offset plan. Comments of Omnicom to *Final Report* at III-5.

21. On the other hand, few commenters supported the proposed 12.5 kHz channeling plan. This support was based largely on the position that this scheme would foster the most efficient utilization of the spectrum given the state-of-the-art technology. The American Petroleum Institute (API) noted that the Commission cited spectrum efficiency when it recently adopted a 12.5 kHz channeling plan for private land mobile use in the 896-901/935-940 MHz bands. API contended that the same consideration should apply to the public safety services. Comments of API at 6. The Special Industrial Radio Service Association (SIRSA) stated that the fears expressed by the public safety community regarding use of unproven equipment are unwarranted. SIRSA contended that in the time before

a National Plan is implemented, the cost of 12.5 kHz equipment will decline and technical improvements will occur. Comments of SIRSA at 6.

22. We have carefully reviewed the information that has been presented on this issue. We are persuaded that for the new public safety band the 25 kHz offset channeling plan recommended by NPSPAC should be adopted. This channeling plan will provide for interoperability with the existing 800 MHz public safety systems, a major consideration in making the allocation. The benefits to the public of interoperability, *i. e.*, faster, better coordinated response of public safety authorities in emergencies, should be substantial. We agree that the recommended 25 kHz offset channeling plan yields a slight reduction in spectrum efficiency relative to a 12.5 kHz plan. This reduction, however, is outweighed by other factors. Among these factors is the need to accommodate sophisticated digital encryption systems and digital data communications systems used in many public safety vehicles today. In light of these factors, we are adopting the 25 kHz offset channeling plan.

23. Because an offset plan requires geographic separation of transmitters operating on adjacent frequencies, the *Final Report* further recommended that transmitters and receivers operating in the new band be of enhanced design so as to minimize the necessary separation.[17] The commenters generally supported NPSPAC's recommendation for transmitter specifications. General Electric, however, is opposed to applying the recommended receiver selectivity standards to portable communications equipment.

24. We are adopting the technical standards for transmitters recommended by NPSPAC for equipment operating in the new bands. We are taking this action in conjunction with the adoption of the 25 kHz offset channeling plan. Adopting these technical standards will reduce adjacent channel interference, permitting closer geographical channel re-use and thereby improving overall spectrum utilization.

25. We are not, however, adopting the receiver standards recommended by NPSPAC. Historically, the Commission has not adopted standards for receiver performance, and we are not persuaded that standards are essential here. Sub-standard receivers do not cause system interference, nor do they threaten effective operation of the public safety network, as would sub- standard transmitters. Public safety agencies can make their own determinations as to whether upgrading their receivers would be cost-effective.[18] Manufacturers are, of course, free to adopt NPSPAC's recommendations as to receiver standards.

### 2. *Mutual Aid Channels*

26. A primary objective of the National Plan is to improve the ability of public safety entities to communicate with one another. *See Notice*, 2 FCC Rcd at 2869, para. 4. Therefore, the Commission proposed to set aside a number of common channels in the new public safety bands on a nationwide basis for coordination and intercommunication purposes. The *Notice* recognized that some regions may require greater interagency communications capability than provided by the nationwide channels and suggested that the individual regions might wish to designate additional intercommunication channels depending on the needs in their respective areas. *Id.* at 2870, para. 12.

27. NPSPAC recommended designating five intercommunication channels on a nationwide basis and that one of these channels be designated as the National Public Safety Calling Channel, with the remaining four channels as tactical channels. *Final Report* at 5. The operation and management of these channels would be identified specifically in the respective regional plans.[19]

28. The *Final Report* recommended that the intercommunication channels be available for federal, state and local disaster management and other emergency situations, but that regions have the option to include other public safety disaster relief or emergency management services in the regional mutual aid network. *Final Report* at 5. Finally, the *Final Report* recommended that: (1) all mobile and portable radios be equipped to operate on the five channels, (2) channel assignments adjacent to the five mutual aid channels be spaced no closer than 25 kHz, and (3) these channels should operate in the conventional mode (non-trunked) with tone coded squelch at a standard frequency of 156.7 Hz to minimize the effects of intermodulation interference. NPSPAC recommended that there be no barrier to regional planning groups identifying additional mutual aid channels in their regions and providing operational guidelines for their use. *Id.* at 7, 17, 21.

29. The commenters were generally unified in their support of the national mutual aid concept. *See , e. g.*, Comments of City of Milwaukee at 2; Comments of the City of Compton at 3. One of the few commenters opposing the mutual aid concept was the City of Oakland, which indicated that "the opportunity for interoperability is sufficient, mandatory interoperability in a single area of the spectrum is inappropriate." Comments of the City of Oakland at 1.

30. We agree that there is a great need for intercommunication. Dedication of channels for the express purpose of intercommunication in non- routine, critical situations will provide public safety agencies with the means to coordinate their responses more effectively. We emphasize that these channels are not intended for routine, administrative, intra-agency communications but are to be reserved for coordination of multiple public safety entities. We shall, therefore, implement NPSPAC's recommendations in Part 90 of our Rules, and we are reserving those frequencies identified by the *Final Report* as mutual aid channels. Any region may reserve additional channels for intercommunication if it finds a need for more such channels.

31. The *Notice* proposed to require manufacturers to include interoperability channels in all equipment using the new 800 MHz channels. *Notice*, 2 FCC Rcd at 2870, para. 13. Several commenters opposed this requirement, arguing that it would increase the cost of equipment and that some small agencies have no interoperability requirements. *See , e. g.*, Comments of New York City Police Department at 2; Comments of the Chicago Police Department at 4. Most commenters, however, favored the proposal. They maintained that the purpose and usefulness of the channels would be undermined if some agencies were to use equipment incapable of intercommunication. *See , e. g.*, Comments of Los Angeles Sheriff's Department at 4; Comments of John Powell at 3.

32. We are satisfied that the proposed requirement will not affect equipment costs appreciably. Equipment is already available in the existing 800 MHz private land mobile band that is programmable over a range of frequencies at little or no cost premium. We agree with

ie majority of commenters that the intercommunication annels would be of little value unless all equipment had iis capability. While some agencies may not anticipate ie need for intercommunication by radio, we expect that ie intercommunication channels will serve as a vital link disasters and major emergencies.[20] In light of the minial costs and great potential benefits, we find it in the ablic interest to adopt this requirement as proposed.[21]

33. The *Notice* also proposed to give all public safety censees blanket authority to operate on any designated tercommunication channel. *Notice*, 2 FCC Rcd at 2870, ra. 13. Nearly all of the commenters with an opinion on is matter opposed the Commission's recommendation. PCO stated that the "adoption of the proposal without a erequisite of coordination of base and control transmitr locations would defeat Regional Planning efforts." mments of APCO at 9. The Los Angeles Sheriff's Deirtment agreed with APCO and further asserted that ily licensees in local government, police, fire, highway aintenance, and forestry-conservation radio services ould be afforded blanket authority. Comments of the s Angeles Sheriff's Department at 4. Finally, DuPage iblic Safety Communications (Du-Comm) stated that he proposed 'Blanket Authorization' is a concern since Illinois [they] have had an experience with this on a HF frequency that has rendered the channel unusable ost of the time when it is needed." Comments of Du-)mm at 3.

34. We are sympathetic to the concerns of the commenrs as to the interference potential of base and control itions because of their relatively higher power and anna heights compared to mobile and portable stations. ise and control transmitters, therefore, must be individlly licensed and may operate only at those specific cations designated in the regional plans. We shall, however, permit all entities operating in accordance with an proved regional plan to operate mobile and portable uipment on the interoperability channels, in accordance th the provisions of paragraph 30.

3. *Trunking*

35. The *Notice* proposed that regional plans incorporate unking or equivalent spectrally efficient technology, iere local demands are heavy, and solicited comment on at issue. *Notice*, 2 FCC Rcd at 2871, para. 16. In reonse, NPSPAC's *Final Report* recommended that any ensee requesting more than four channels be required adopt trunking technology unless the licensee can demstrate that its proposed system is of comparable effincy to a trunked system or that a trunked system will t meet operational requirements. *Final Report* at 20.

36. Most commenters agreed that trunking should be couraged as a means of improving spectrum efficiency, t argued that it should not be mandated at the national vel. For example, the Southern California Regional mmunications Planning Committee (Planning Committee) supported the position that trunking be required iere channel requirements are heavy, but indicated that some applications trunking might not satisfy operonal requirements. Comments of Planning Committee 3. The Planning Committee recommends that, in situons where it can be demonstrated that trunking would detrimental, agencies should not be forced to develop d operate trunked systems. *Id.* at 4.

37. NPSPAC's recommendation strikes a reasonable balance between the need to implement spectrum efficient technology and the need to consider the limited resources of small users. Therefore, we conclude that smaller entities may use conventional systems of four channels or less. Entities requiring greater capacity, however, should establish trunked systems or, alternatively, share trunked systems with other users. Implementation of trunking is important not only to ensure that near-term use is accommodated, but also to provide for growth and preserve opportunities for other potential services. Accordingly, we are amending Part 90 of our Rules to require trunking for licensees requiring more than four channels, consistent with NPSPAC's recommendation. Exceptions will be permitted only when a substantial showing is made that alternative technology would be at least as efficient as trunking or that trunking would not meet operational requirements. Exceptions, will not be granted routinely, however, and strong evidence showing why trunking is unacceptable must be presented in support of any request for exception. We will require that the regional plans explain their criteria for exemption. We also require that applications for licensing of conventional channels contain a certification by the coordinator that they conform with the regional plans.

38. We are aware that several different types of trunked systems are available and are not compatible. The *Notice* did not propose standards for trunked systems. NPSPAC does not recommend adoption of a standard. It suggests, however, that such systems be based on use of a standard queuing theory. *Final Report* at 21. We believe that the performance of a trunked system, including queuing method, is best left to the discretion of each individual licensee. Establishing a standard by Commission order might well limit technological improvement in this area. Accordingly, we are not adopting trunking performance standards. All trunked systems will be required, however, to operate in a conventional and compatible mode on the intercommunication channels. These channels will thus provide a common interface between different types of trunked systems.

4. *Loading*

39. The *Notice* proposed that the loading standards for the existing 800 MHz band be applied to the new public safety channels. Mutual aid channels would not be considered when determining system loading. *Notice*, 2 FCC Rcd at 2871, para. 20. That is, conventional systems would be required to load to 70 mobiles per channel and trunked systems to 100 mobiles per channel.[22] NPSPAC recommended that the Commission adopt a more flexible approach to loading for public safety systems. In particular, NPSPAC noted that the spectrum efficiency of a trunked system depends on such things as the number of channels, average length of communications, and type of queuing used by the system. NPSPAC argued that each type of public safety system presents a different challenge with respect to system engineering, and, therefore, loading standards should be developed separately for each such system. In making this determination, NPSPAC continued, the Commission should consider channel blocking and establish a guideline as to acceptable blocking percentages. NPSPAC did not, however, offer any proposals as to blocking percentages or loading standards. *See Final Report* at 20-21.

40. We find that efficient use of the public safety spectrum requires application of loading standards. We have no basis on which to apply a standard different from the standard for existing public safety services authorized in the 800 MHz band. We shall, therefore, apply the existing loading standards for the 800 MHz band to the new public safety channels. We also find, however, that some flexibility to accommodate different perceived public safety needs is desirable. We shall, therefore, waive our loading standards when a compelling case for waiver is made.

## IV. IMPLEMENTATION OF THE PLAN

### A. *Regional Boundaries*

41. In the *Notice*, the Commission asked NPSPAC to recommend specific regional boundaries. *Notice*, 2 FCC Rcd at 2870, para. 8. In its *Final Report*, NPSPAC recommended that the country be divided into fifty-four regions.[23] NPSPAC developed these regions by consensus, taking into account experience in coordination and administration of public safety operations, and the size of the regions to be administered. *See Final Report* at 26-27.[24] NPSPAC noted that it may be necessary in the future to modify regions, but suggested that no region should be smaller than a Primary Metropolitan Statistical Area.

42. The comments generally supported the regions proposed by NPSPAC, and we are adopting them largely as proposed.[25] Although fewer regions might offer some benefits in encouraging uniformity and broader coordination, the complexity of the planning process in each region would greatly increase with the size of the region. Further, increasing the size of regions would multiply the number of political jurisdictions included in each region, which could greatly slow the planning process and reduce the responsiveness of that process to unique local needs and characteristics. Moreover, the reduced responsiveness to local needs inherent in planning for larger regions could be expected to increase the number of waiver requests to the Commission regarding regional plans. Resolving these requests would not only burden Commission staff resources but would also require substantial Commission involvement in local public safety planning matters that would better be resolved locally. In light of these considerations and the fact that NPSPAC's proposal seems to have the support of the public safety community, we adopt NPSPAC's proposal as to regional boundaries with minor modifications and clarifications.

43. The Committee did not delineate specific boundaries for those proposed regions that include parts of one or more states. Therefore, we have developed and set forth boundaries for those regions that do not coincide with state boundaries. For Texas, in which NPSPAC proposed six regions, we have created a single region. While we recognize that the six regions proposed by NPSPAC have distinct characteristics, the single Texas region may, if it wishes, create sub-regions, define boundaries for those sub-regions, and develop its plan accordingly. Further, while NPSPAC has proposed interstate regions consisting of parts of Illinois, Indiana, Michigan, and Wisconsin, we believe that public safety requirements in border areas of these states can best be satisfied through cooperative efforts of the regional planning committees in these states. We shall not, therefore, establish interstate regions in that area as proposed by NPSPAC. Our primary considerations in defining regions are: (1) to define regions so there is no ambiguity regarding the area included; and (2) to include all the land area of the United States, including Puerto Rico and the Virgin Islands. The regions that we are, by this Order, establishing are listed in Appendix B to this *Report and Order*.

44. We shall consider changes to the regional boundaries, provided the Regional Planning Chairmen in the affected regions agree to the changes. *See* para. 48, *infra*. Two or more regions may consolidate into one region. region may develop subregions for planning purposes, but the region may submit only one regional plan. Any proposals for alterations to regional boundaries must be approved by this Commission.[26]

### B. *Development of Regional Plans*

45. The Commission has adopted the regional boundaries listed in Appendix B to minimize potential inter-regional conflicts. Some metropolitan areas have been established as independent regions. There are many other metropolitan areas throughout the country, however, that overlap regional boundaries. These regions will have to work together to coordinate their respective regional plans, particularly as they affect these metropolitan areas. We recognize that many diverse interests will have to be reconciled in any negotiations between adjacent regions. Compromises may have to be made before regional plans can be drafted that adequately respond to all the public safety and special emergency communication requirements in the areas involved. We are confident, however, that the regional planning committees can develop effective procedures to resolve any inter-regional coordination problems.

46. We envision a process whereby the regional plans will be developed by regional planning committees, as proposed by NPSPAC. NPSPAC suggested, however, that these committees be comprised only of governmental entities to avoid complicating the planning process. *Final Report* at 24-30. [27] In order to meet public safety communications needs as effectively as possible, however, we believe that broad participation in the planning process is critical. We conclude, therefore, that membership on these committees must be open to representatives from all eligible user groups, including governmental and non-governmental entities. Only in this way can we assure that the needs of all potential spectrum users will be considered.

47. The Associated Public-Safety Communications Officers, Inc. (APCO), acting under its frequency coordination responsibilities, will be responsible for convening a meeting to initiate the planning process in each region.[28] For each region, APCO should appoint a local convenor who will be responsible for organizing and publicizing the first planning meeting. We request that APCO provide the Chief, Private Radio Bureau with a list of the convenors and their addresses within 45 days of the release date of this *Report and Order*. The convenor should set a date for the initial planning meeting, allowing at least 60 days for appropriate public notifications. Parties interested in participating in the regional planning process should contact the appropriate convenor. Officials responsible for National Security and Emergency Preparedness within the region should be notified of the initial planning meeting and invited to participate.

48. At the first meeting, a Regional Chairman must be elected from among the membership. Once a Chairman has been elected, APCO should certify the name to the Chief, Private Radio Bureau. The Committee should pro-

mptly adopt operating procedures to govern its operations. These procedures must ensure that all entities will be treated fairly in the planning process.

49. In developing their regional plans, the committees should take into account the National Plan criteria, local needs, and inter-regional considerations. Once the plan for a region has been finalized, an original and five copies of the plan should be forwarded by the Regional Planning Chairman to the Secretary, Federal Communications Commission, Washington, D.C. 20554.

C. *Contents of Regional Plans*

50. Our *Notice* discussed the types of information to be included in the regional plans. The *Notice* proposed that the regional plans indicate that the needs of all public safety users in the region have been considered. Further, the *Notice* proposed that the regional plans include spectrum utilization plans that take into account local needs and attempt to maximize spectrum efficiency through application of technologies such as trunking and through good engineering practice, such as limiting radiated power to that necessary to cover service areas. *Notice*, 2 FCC Rcd at 2870, para. 10. NPSPAC and the commenters support this proposal. *See , e. g., Final Report* at 20-21; Comments of Regents of University of California at 10-11.

51. We have carefully reviewed the comments and have considered the elements that all regional plans should include. We have concluded that all regional plans must include the following information: (1) a cover page that clearly identifies it as the regional plan for the defined region; (2) the name of the Regional Planning Chairman, including mailing address and telephone number; (3) the names of the members of the regional planning committee, including organizational affiliations, mailing addresses and telephone numbers; (4) a summary of the major elements of the plan; (5) a general description of how the spectrum is to be allotted among the various eligible users within the region; (6) an explanation of how the requirements of all eligible entities within the region were considered and met to the degree possible; (7) an explanation as to how eligible entities have been prioritized in areas where not all can receive licenses; (8) an explanation of how the plan has been coordinated with adjacent regions; (9) a detailed description of how the plan puts the spectrum to the best possible use by requiring system design with minimum coverage areas, by assigning frequencies so that maximum frequency reuse and offset channel use may be made, by using trunking, and by requiring small entities with minimal requirements to join together on a single system where possible;[29] and (10) the signature of the Regional Planning Chairman.[30]

52. The regional plans must also address operational issues. For example, each plan must explain how the interoperability channels are to be managed within the region. In addition, each plan should describe the provisions that have been made to ensure that these channels will work and be managed effectively across regional boundaries.

D. *Review of the Regional Plans*

53. In the *Notice*, we proposed that the regional plans be submitted to the Commission for review and that no assignments be made in a region until the plan for that region has been accepted by the Commission. *Notice*, 2 FCC Rcd at 2870, para. 8. We also solicited comment on criteria that should be used to evaluate regional plans. *Id.* at para. 9. Comments submitted generally supported the concept of public review and comment on each regional plan after submission to the Commission. *See , e. g.*, Comments of County of Riverside at 2; Comments of SIRSA at 6. Commenters also indicated that they expected the Commission to review the regional plans for conformance with the National Plan prior to approving them and authorizing use of the new spectrum. *See , e. g.*, Comments of City of Peoria at 10; Comments of California Public Safety Radio Association at 2-3. The NPSPAC *Final Report* recommended that the Commission solicit public comment on each regional plan for thirty days, review the comments, and either approve the plan as submitted or return the plan to the regional planning committee with reasons for rejection of the plan. *Final Report* at 30.

54. We agree with the commenters and NPSPAC that placing regional plans on public notice and soliciting comments are desirable. Accordingly, we shall give public notice of the regional plans as we receive them. Interested parties will be given thirty days to comment and fifteen days to reply to any comments filed.

55. During the review process, the Commission will consider the plans and the comments and replies, giving due deference to the need to allow the regional plans to accommodate regional differences. The Commission will examine the plans to ensure that public safety needs have been fully addressed and met to the degree possible, that the spectrum has been used efficiently, that coordination with adjacent regions has occurred, and that all requirements of the National Plan (as defined by paragraphs 11 through 40 of this document) have been met. The Private Radio Bureau and the Office of Engineering and Technology, on authority delegated by this Commission, will either accept the regional plan by issuing an order to that effect, or return the plan to the Regional Planning Chairman with reasons for rejection.

56. The *Final Report* also recommends the establishment of a Regional Plan Review Committee (RPRC), consisting of one representative from each region to provide guidance and assistance in developing regional plans, to mediate inter-regional resolution of problems that may arise, and to consider modifications to regional plans that may be necessary to satisfy future operational requirements. *Final Report* at 32. NPSPAC recommends that the RPRC meet once a year to monitor the progress of the regional planning process, consider any proposed changes, and send its recommendations to the Commission. We believe such a committee could provide valuable assistance to the public safety community during the planning process, particularly when modifications to regional plans become necessary to satisfy new operational requirements. The public safety community is free to establish such a committee if it wishes.

E. *Modification of Regional Plans*

57. NPSPAC points out that modification of the regional plans may be necessary after approval. *Final Report* at 56. APCO, acting in its frequency coordination role, or the Regional Planning Chairman may recommend, in writing, changes to a regional plan. The Commission will give prompt public notice soliciting comment on any such proposals and issue appropriate orders upon review.

## V. MISCELLANEOUS ISSUES

### A. *Vacated and Unused Frequencies*

58. A primary objective of this proceeding is to promote efficient use of available public safety spectrum. *Notice*, 2 FCC Rcd at 2869, para. 4. To this end, in addition to the technical specifications we have established for spectrum utilization, we intend to provide incentives for public safety entities to utilize fully all their spectrum resources in a timely manner. We acknowledge the complexity of anticipating the communications requirements of diverse entities over an extended period of time. We are also sensitive to the delays inherent in budgetary cycles and replacement of embedded equipment. The public interest would not be served, however, by an indefinite "warehousing" of spectrum. Such an approach would be inconsistent with our actions in other proceedings aimed at satisfying the future needs of land mobile users. Our decision regarding the disposition of vacated and unused frequencies will allow adequate time for identification of public safety requirements but will also consider the need for additional spectrum by other land mobile users and services.

#### 1. *Vacated Frequencies*

59. The *Notice* recognized that establishing a "backbone" public safety band at 800 MHz might result in a substantial migration from the lower frequency bands currently used by public safety entities. Consequently, we raised the issue of whether, and under what circumstances, we should require the release of channels in the lower frequency bands as a result of moving public safety radio systems to the new 800 MHz spectrum. *Notice*, 2 FCC Rcd at 2870, para. 11.

60. Allocation of the vacated lower-band frequencies was highly debated among the commenters. Most public safety entities indicated that lower-band frequencies would remain an important part of the regional planning process. They also agreed that criteria were necessary for determining when frequencies are available for reassignment. *See*, *e. g.*, Reply Comments of APCO at 14-15; Comments of County of Orange at 4. In joint comments, the International Association of Fire Chiefs (IAFC) and the International Municipal Signal Association (IMSA) expressed concern that we not require users to migrate to 800 MHz and relinquish their lower-band allocations. Joint Comments of IAFC/IMSA at 4-6. Conversely, non-public safety land mobile users stated that they too have a need for spectrum below 800 MHz and argued that public safety entities using the 800 MHz channels be required to demonstrate a compelling need for retention of their lower-band allocations. *See*, *e. g.*, Comments of SIRSA at 8-9; Comments of API at 8; Comments of Utilities Telecommunications Council at 8; Comments of Forest Industries Telecommunications at 3-4.

61. In response to our *Notice*, NPSPAC's *Final Report* observes that in heavily populated areas, all frequencies in lower bands would remain fully occupied.[31] Nonetheless, the *Final Report* recommends that public safety entities be required to surrender their vacated lower frequencies if the following three conditions are met: (1) the new system fully replaces the functions of the old one, (2) the licensee has no other communications requirements that could be met through use of the lower frequencies, and (3) the new system has operated satisfactorily for long enough to allow a smooth transition from former operations and to demonstrate its reliability. *Final Report* at 47-48. The *Final Report* further recommends that reassignment of vacated frequencies to public safety entities be accomplished on a regional level, and that non-public safety assignments be handled by the recognized frequency coordinators pursuant to our existing interservice sharing rules. *Final Report* at 53-56; *see* 47 C.F.R. § 90.176.

62. We do not see the need for public safety entities shifting their operations to the new 800 MHz spectrum to retain their lower band frequencies. The Commission has made a substantial new allocation of spectrum to meet present and foreseeable public safety needs. We expect that as licenses move to this new spectrum they will make every effort to give up their lower band frequencies so that others may use them.

#### 2. *Unused 800 MHz Frequencies*

63. Our *Notice* proposed that the regional planning process be completed no later than five years after adoption of final rules in this proceeding. We further proposed that, at that time, any channels that have not been identified as needed to satisfy future public safety requirements would be considered for other uses. *Notice*, 2 FCC Rcd at 2871, para. 18.

64. The *Final Report* contended that five years is insufficient for identifying all public safety spectrum requirements and argued to maintain a twenty five year time period for implementation of the regional plans. *Final Report* at 53-56. At the same time, the *Final Report* recognized that the communications requirements of public safety entities could vary greatly from region to region. In those regions where the demand for additional spectrum exceeds or approximates availability, the *Final Report* projected that the release of unutilized spectrum will not prove to be an issue. *Id.* at 53.

65. To encourage efficient utilization of the new 800 MHz channels, the *Final Report* proposed that the burden be placed upon the individual regions to justify retention of the public safety spectrum. Specifically, the *Final Report* recommends that two years after our adoption of a National Plan, we notify the public of the regions that have approved plans or that have submitted plans for approval. The Commission would then set a three-year deadline for submission of additional regional plans. At the close of the three-year period, the *Final Report* further recommends that the Commission institute a Rule Making proceeding aimed at reallocating fifty percent of the spectrum in geographic areas without regional plans. A second deadline would be established five years after the conclusion of the fifty percent reallocation proceeding, at which time an additional thirty percent of the spectrum would be reallocated. NPSPAC recommends that the remaining twenty percent of the spectrum be held in reserve for future public safety communications requirements that cannot be satisfied through technological advancements, considering all bands. Finally, NPSPAC concludes that any region that does not take advantage of the new 800 MHz allocation after the National Plan has been in place for twelve years is capable of meeting all public safety requirements for the 25-year planning period through existing 800 MHz and lower-band frequencies. *Final Report* at 54.

66. Most public safety entities agreed with NPSPAC's recommendation that the new 800 MHz channels be reserved for exclusive public safety use for a period sufficient to meet long-term public safety communications

requirements. *See* , *e. g.*, Reply Comments of County of Orange at 3-4. Moreover, there was a general consensus among public safety entities that any present discussion of reallocating unused 800 MHz frequencies is premature and unwarranted. *See* , *e. g.*, Comments of APCO at 14-15; Comments of City of Tulsa Police Department at 4. SIRSA recommended, however, that the 800 MHz channels be made available for general land mobile use after the adoption of regional plans. Comments of SIRSA at 8. API also requested that the new spectrum be made available to other land mobile users on a primary use basis five years after adoption of a National Plan. Comments of API at 8.

67. As the *Final Report* recognizes, this newly allocated spectrum might be under-utilized if regions fail to submit their plans promptly. *Final Report* at 53-55. It is also conceivable that a regional plan could be submitted that does not fully utilize the 800 MHz allocation, or that a region would submit a plan to reserve use of the frequencies, and then unreasonably delay implementation. We believe that the public interest dictates that plans for effective and efficient use of this spectrum be developed promptly. We expect that all regions will have filed regional plans within five years. We shall reassess the state of development of regional plans and the amount of unused spectrum after five years. If no plan has been submitted for a particular region, we shall move to open the spectrum for intercategory sharing in that region. Additionally, spectrum not identified for use in a region having a plan may be made available for intercategory sharing.

B. *Use of Cellular and Mobile Satellite Services*

68. NASA and several mobile-satellite interests argued that the planned mobile-satellite service (MSS) and cellular radio service should be considered for satisfying part of public safety's communications requirements. They argued that MSS and cellular can provide intercommunication capability and that these technologies are spectrum efficient. Accordingly, they suggested that use of the mobile-satellite service and the cellular radio service be taken into account in developing the National Plan. *See* , *e. g.*, Comments of NASA at 6; MSS Joint Comments at 5. In response, several public safety agencies stated that MSS and cellular should not be considered in developing the National Plan. *See* , *e. g.*, Reply Comments of City of Dallas to *Final Report* at 1-2. They pointed out that while cellular has applications that are useful to public safety agencies, such as for general telephone service, cellular service cannot satisfy many public safety requirements. Specifically, they cited the inability to ensure an available communication channel in times of emergency, the time delay in dialing calls and the costs of cellular service. *Id.* With regard to MSS, they pointed out that the service is not now available and is not expected to be available for several years. Therefore, they stated that it is too soon to determine the future usefulness of MSS for public safety.

69. We recognize that the cellular radio service has applications that are useful to public safety agencies. Cellular systems as they currently exist, however, are designed to provide telephone service and do not provide the features required by public safety for dealing with emergency situations. Therefore, we agree that cellular service is currently not a substitute for dedicated public safety communications systems. Future technological improvements, however, may increase the usefulness of this service for public safety.

70. Regarding MSS, we expect that MSS will augment rather than supplant terrestrial public safety systems. MSS may be useful for providing intercommunications in remote areas or in unusual wide-area disaster situations. Such factors as lower cost, higher frequency reuse of terrestrial systems, and performance (*i. e.*, better communications reliability), however, are likely to lead to continued predominant use of conventional land mobile systems. Therefore, we believe that the needed interoperability can be achieved only among land-based systems. We nevertheless encourage regional planners to take into account the cellular radio service and the planned mobile-satellite service in satisfying public safety needs.

C. *Federal Agency Concerns*

71. The National Telecommunications and Information Administration (NTIA), states that it and the other federal agencies, through the Interdepartment Radio Advisory Committee, have been closely following the Commission's development of a National Plan and have participated in NPSPAC's meetings. NTIA supports the regional planning process as a practical means of allowing local flexibility while providing nation-wide consistency. NTIA strongly supports establishment of interoperability channels to facilitate coordination among local, state and federal agencies. NTIA recommends that the Commission proceed with development of the National Plan but urges that the Commission obtain additional information as to interoperability requirements of local, state and federal agencies. NTIA Comments at 2-6. *See also* Comments of National Aeronautics and Space Administration (NASA) at 3. Further, both NTIA and the Federal Emergency Management Agency (FEMA) argue that the Commission should coordinate its development of a National Plan with FEMA and the National Communications System (NCS), which are responsible for developing a national security and emergency preparedness (NSEP) plan. NTIA Comments at 6-8; FEMA Comments at 2-5. FEMA questions whether the Commission's National Plan effort has complied with the spirit and direction of National Security Directive (NSDD)-47 and Executive Order 12472 regarding national security and emergency preparedness programs. FEMA Comments at 2-5.

72. APCO, in responding to the comments filed by NTIA, NASA and FEMA, states that it is clearly the Commission's statutory role, and not FEMA's, to allocate non-federal spectrum and to establish service rules and technical standards for the use of that spectrum. Reply Comments of APCO at 3. Further, APCO notes that the Commission's proceeding, as mandated by Congress, develops a plan for day-to-day operations for state and local governments, not a NSEP plan. APCO contends that everything NTIA suggests should be done is being done through the Commission's Rule Making process. APCO notes, however, that all public safety communications requirements and the need to plan for them will not be met in this one effort. It argues that planning for daily operational systems as well as national emergencies will require a continuing, comprehensive effort.

73. The Commission's effort to develop a National Plan was initiated in response to a Congressional directive dealing with spectrum availability for state and local public safety agencies. As NTIA notes, it and other federal agencies were invited to participate, and did participate, in that process.[32] We have carefully reviewed National Security Decision Directive (NSDD)-47 and Executive Order

12472. These documents clearly instruct FEMA and NCS to deal with disaster management and national emergencies. The documents do not discuss spectrum issues or the usual operations of state and local public safety agencies, which are the primary concerns of our National Plan.

74. NSDD-47 and Executive Order 12472 direct FEMA and NCS to accomplish their purposes by using to the maximum extent the existing facilities and resources of the federal government and, with their consent the facilities and resources of states, local political subdivisions, and other organizations and agencies. In the National Plan we are adopting here, we have established intercommunication channels that will be available to federal, state and local public safety entities. Therefore, we believe that our action here is compatible with and supportive of the directives to FEMA and NCS. Moreover, we have directed that agencies responsible for National Security and Emergency Preparedness be notified and invited to participate in the planning process. *See* para. 47, *supra*. We strongly encourage federal public safety and emergency preparedness agencies to participate in the regional planning process.

## VI. FINAL REGULATORY FLEXIBILITY ANALYSIS

75. The Commission is adopting this *Report and Order* to implement a National Public Safety Plan and associated service rules to govern use of the 821-824/866-869 MHz bands in response to a directive from Congress to develop a plan to accommodate current and future spectrum requirements of public safety entities in this country. No comments were received that specifically addressed the Initial Regulatory Flexibility Analysis incorporated into our *Notice* pursuant to 5 U.S.C. § 603. This action will have a favorable impact on this nation's public safety and special emergency entities by providing them with additional spectrum resources with which to help satisfy their mobile communication requirements. Additionally, this action will benefit the general public by improving the overall quality and availability of critical safety of life and property services.

76. The only alternatives to this action suggested by the commenters were to employ cellular and mobile-satellite services to satisfy needs for intercommunication among public safety entities. As discussed above, these are not satisfactory alternatives. There are no other significant alternatives that would accomplish our stated objectives of developing technical standards for the 821-824/866-869 MHz band and developing and implementing a Public Safety National Plan.

## VII. PAPERWORK REDUCTION ACT STATEMENT

77. The decisions contained herein have been analyzed with respect to the Paperwork Reduction Act of 1980 and found to impose a new information collection requirement on the public as a result of the creation of regional planning committees and the requirement that they prepare and submit to the Commission a regional plan. Implementation of new or modified requirements will be subject to approval by the Office of Management and Budget as prescribed by the Act.

## VIII. ORDERING CLAUSES

78. Accordingly, IT IS ORDERED that, pursuant to the authority of Sections 4(i), 301 and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 4(i), 301, and 303(r), Parts 0 and 90 of the Commission's Rules, 47 C.F.R. Parts 0 and 90, ARE AMENDED as set forth in Appendix C below.

79. IT IS FURTHER ORDERED that this Order will become effective **February 1, 1988.**

80. IT IS FURTHER ORDERED that this proceeding IS TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION

William J. Tricarico
Secretary

## APPENDIX A

*Commenters to Notice of Proposed Rule Making and NPSPAC Initial Report*

Albuquerque Police Department, New Mexico
American Hospital Association
American Petroleum Institute
Arcadia Police Department, California
Associated Public Safety Communication Officers, Inc.
Boston University Police Department
California Peace Officers Association
California Public-Safety Radio Association, Inc.
California Telecommunications Division
Chicago Police Department
Colton Police Department, California
Compton Police Department, California
Connecticut Bureau of Statewide Emergency Telecommunications
Connecticut Department of Public Safety
Culver City, California
Denver, Colorado, City and County
E. F. Johnson Company
El Cajon Police Department, California
Electronic Industries Association, Land Mobile Radio Section
Eugene Police, Fire & Emergency Services Department, Oregon
Federal Emergency Management Agency
Florida Division of Communications
Forest Industries Telecommunications
Fort Myers Police Department, Florida
General Electric Company
Glendora Police Department, California
Griffin, Frederick G., P.C.
Hawaii County Police Department
Honolulu Police Department, City and County

International Association of Fire Chiefs, Inc. (joint with IMSA)
International Municipal Signal Association (joint with IAFC)
Long Beach Police Department, California
Los Angeles, City of
Los Angeles County
Los Angeles County Sheriff
Los Angeles Fire Department
Los Angeles Police Department
Lynchburg Police Department, Virginia
MSS Joint Comments (Global Land Mobile Satellite Services, Hughes, McCaw, MCCA, Mobile Satellite Corp., and Skylink)
Maryland Office of Telecommunications Management
Maximum Service Telecasters, Association of
McCaw Communication Companies, Inc.
MicroControl Corporation
Milwaukee Police Department
Motorola, Inc.
Mountain States Telephone and Telegraph (joint with NW Bell Tel. & Pac. NW Bell)
National Aeronautics and Space Administration
National Telecommunications and Information Administration
New Jersey Emergency Response System Study Commission
New Jersey State Police New York Metropolitan Area Committee for Public Safety Spectrum Relief
New York City Police Department
Newport News Police Department, Virginia
North Central Texas Public Safety Communications Advisory Committee Northwestern Bell Telephone Co. (joint with Mountain States Tel. & Tel. & Pac. NW Bell)
Oakland Police Department, California
Orange County, California
Ozaukee County Sheriff's Department, Port Washington, Wisconsin Pacific Northwest Bell Telephone Co. (joint with Mountain States Tel. & Tel. & NW Bell)
Peoria, Illinois, City of Port Authority of New York and New Jersey (joint with NY Metro. Area Cmte.)
Powell, John S.
Redondo Beach Police Department, California
Riverside County, California, Department of Communications
San Jose Police Department, California
Seattle Police Department
South Carolina Southern Calif. Pub. Safety Regional Communications Planning Committee
Special Industrial Radio Service Association, Inc.
Teltron
Triton College Police Department, Illinois
Tulsa Police Department, Oklahoma
University of California Regents
University of Georgia Police Department
Utilities Telecommunications Council
Warren County Communications Department, Ohio
Weatherford Police Department, Texas
Winston-Salem Police Department, North Carolina

*Reply Commenters to NPRM and NPSPAC Initial Report*

Aeronautical Radio Inc. & Air Transport Association of America (joint)
American Hospital Association
Associated Public-Safety Communications Officers, Inc.
California Public-Safety Radio Association, Inc.
Dallas, City of
DuPage Public Safety Communications, Illinois
Electronic Industries Association, Land Mobile Radio Section
Forest Industries Telecommunications
General Electric Company
Los Angeles County
Los Angeles County Sheriff
Maximum Service Telecasters, Association of
Motorola, Inc.
New York Metropolitan Area Committee for Public Safety Spectrum Relief
North Central Texas Public Safety Communications Advisory Committee
Ohio State Highway Patrol
Orange County, California
Port Authority of New York and New Jersey (joint with NY Metro Area Cmte.)

*Commenters to NPSPAC Final Report*

American Petroleum Institute
Associated Public-Safety Communications Officers, Inc.
California Public-Safety Radio Association, Inc.
Culver City, California
Forest Industries Telecommunications
General Electric Company
International Association of Fire Chiefs, Inc. (joint with IMSA)
International Municipal Signal Association (joint with IAFC)
Los Angeles County
Maximum Service Telecasters, Association of
Mobile Satellite Service Applicants (Hughes, MCCA, McCaw, Mobile Satellite Corp., Skylink, Transit, North American Mobile Satellite, and Satellite Mobile Telephone Co.)
Omnicom, Inc.
New York Metropolitan Area Committee for Public Safety Spectrum Relief
Port Authority of New York and New Jersey (joint with NY Metro Cmte.)
Prince George's County Fire Department, Maryland
South Carolina
Special Industrial Radio Service Association, Inc.
Teltron

*Reply Commenters to NPSPAC Final Report*

American SMR Network Association, Inc.
Associated Public-Safety Communications Officers, Inc.
Dallas, City of
General Electric Company
Los Angeles County
Motorola, Inc.
New York Metropolitan Area Committee for Public Safety Spectrum Relief
North Central Texas Public Safety Communications Advisory Committee
Port Authority of New York and New Jersey (joint with NY Metro. Area Cmte.)

## APPENDIX B
## LIST OF REGIONS

1. ALABAMA
2. ALASKA
3. ARIZONA
4. ARKANSAS
5. CALIFORNIA-SOUTH (to the northernmost borders of San Luis Obispo, Kern, and San Bernardino Counties
6. CALIFORNIA-NORTH (that part of California not included in CALIFORNIA-SOUTH)
7. COLORADO
8. NEW YORK-METROPOLITAN (Fairfield County, CONNECTICUT; (Bronx, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk and Westchester Counties, NEW YORK; Bergen, Essex, Hudson, Morris, Passaic, Sussex and Union Counties, NEW JERSEY)
9. FLORIDA
10. GEORGIA
11. HAWAII
12. IDAHO
13. ILLINOIS
14. INDIANA
15. IOWA
16. KANSAS
17. KENTUCKY
18. LOUISIANA
19. MAINE; NEW HAMPSHIRE; VERMONT; MASSACHUSETTS; RHODE ISLAND; CONNECTICUT (except Fairfield County)
20. MARYLAND; WASHINGTON, D.C.; VIRGINIA-NORTHERN (Arlington, Fairfax, Fauquier, Loudoun, Prince William, and Stafford Counties, and Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park Cities)
21. MICHIGAN
22. MINNESOTA
23. MISSISSIPPI
24. MISSOURI
25. MONTANA
26. NEBRASKA
27. NEVADA
28. NEW JERSEY (except for counties included in NEW YORK-METROPOLITAN, Region 8, above); PENNSYLVANIA (Bucks, Chester, Montgomery, and Philadelphia Counties); DELAWARE
29. NEW MEXICO
30. NEW YORK (All except area in NEW YORK-METROPOLITAN, Region 8, above)
31. NORTH CAROLINA
32. NORTH DAKOTA
33. OHIO
34. OKLAHOMA
35. OREGON
36. PENNSYLVANIA (All except area in Region 28, above)
37. SOUTH CAROLINA
38. SOUTH DAKOTA
39. TENNESSEE
40. TEXAS
41. UTAH
42. VIRGINIA (All except for area in Region 20, above)
43. WASHINGTON
44. WEST VIRGINIA
45. WISCONSIN
46. WYOMING
47. PUERTO RICO
48. U.S. VIRGIN ISLANDS

## APPENDIX C

A. *Amendments to Part 0 of the Commission's Rules and Regulations*

1. The authority citation for Part 0 continues to read:

Authority: Secs. 4, 303, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, unless otherwise noted. Implement; 5 U.S.C. 552, unless otherwise noted.

2. New Section 0.335 is added to read as follows:

§ 0.335 Authority delegated jointly to the Chief of the Private Radio Bureau and the Chief Engineer.

Authority is delegated jointly to the Chief of the Private Radio Bureau and the Chief Engineer to review and accept regional plans submitted and modifications thereto as required under the public safety National Plan adopted in General Docket 87-112.

B. *Amendments to Part 90 of the Commission's Rules and Regulations*

3. The authority citation for Part 90 continues to read:

Authority: Secs. 4, 303, 48 Stat., as amended, 1066, 1082; 47 U.S.C. 154, 303.

4. New Section 90.16 is added to read as follows:

§ 90.16 Public Safety National Plan.

The Commission has established a National Plan which specifies special policies and procedures governing the Public Safety Radio Services and the Special Emergency Radio Service. The National Plan is contained in the *Report and Order* in General Docket No. 87-112. The principal spectrum resource for the National Plan is the 821-824 MHz and the 866-869 MHz bands. The National plan establishes planning regions covering all parts of the United States, Puerto Rico, and the U.S. Virgin Islands. No assignments will be made in the 821-824 MHz and 866-869 MHz bands until a regional plan for the area has been accepted by the Commission.

5. The frequency table in paragraph (b) of Section 90.17 is amended by revising frequency band "806-821" to read "806-824" and revising frequency band "851-866" to read "851-869".

6. Paragraph (c)(15) of Section 90.17 is revised to read:

* * * * *

(c) * * *

(15) Subparts M and S contain rules for assignment of frequencies in the 806-824 MHz and 851-869 MHz bands.

* * * * *

7. The frequency table in paragraph (d) of Section 90.19 is amended by revising frequency band "806-821" to read "806-824" and revising frequency band "851-866" to read "851-869".

8. Paragraph (e)(22) of Section 90.19 is revised to read:

* * * * *

(e) * * *

(22) Subparts M and S contain rules for assignment of frequencies in the 806-824 MHz and 851-869 MHz bands.

* * * * *

9. The frequency table in paragraph (b) of Section 90.21 is amended by revising frequency band "806-821" to read "806-824" and revising frequency band "851-866" to read "851-869".

10. Paragraph (c)(10) of Section 90.21 is revised to read:

* * * * *

(c) * * *

(10) Subparts M and S contain rules for assignment of frequencies in the 806-824 MHz and 851-869 MHz bands.

* * * * *

11. The frequency table in paragraph (b) of Section 90.23 is amended by revising frequency band "806-821" to read "806-824" and revising frequency band "851-866" to read "851-869".

12. Paragraph (c)(10) of Section 90.23 is revised to read:

* * * * *

(c) * * *

(10) Subparts M and S contain rules for assignment of frequencies in the 806-824 MHz and 851-869 MHz bands.

* * * * *

13. The frequency table in paragraph (b) of Section 90.25 is amended by revising frequency band "806-821" to read "806-824" and revising frequency band "851-866" to read "851-869".

14. Paragraph (c)(16) of Section 90.25 is revised to read:

* * * * *

(c) * * *

(16) Subparts M and S contain rules for assignment of frequencies in the 806-824 MHz and 851-869 MHz bands.

* * * * *

15. New Section 90.34 is added to read as follows:

§ 90.34 Public Safety National Plan.

The Commission has established a National Plan which specifies special policies and procedures governing the Public Safety Radio Services and the Special Emergency Radio Service. The National Plan is contained in the *Report and Order* in General Docket No. 87-112. The principal spectrum resource for the National Plan is the 821-824 MHz and the 866-869 MHz bands. The National plan establishes planning regions covering all parts of the United States, Puerto Rico, and the U.S. Virgin Islands. No assignments will be made in the 821-824 MHz and 866-869 MHz bands until a regional plan for the area has been accepted by the Commission.

16. The frequency table in paragraph (a) of Section 90.53 is amended by revising frequency band "806-821" to read "806-824" and revising frequency band "851-866" to read "851-869".

17. Paragraph (b)(21) of Section 90.53 is revised to read:

* * * * *

(b) * * *

(21) Subparts M and S contain rules for assignment of frequencies in the 806-824 MHz and 851-869 MHz bands.

* * * * *

18. Section 90.175 is amended by revising paragraph (b) to read as follows:

**§ 90.175 Frequency coordination requirements.**

* * * * *

(b) For frequencies between 470 and 512 MHz, 806-824/851-869 MHz, and 896- 901/935-940 MHz: A statement from the applicable coordinator recommending specific frequencies that are available for assignment in accordance with the loading standards and mileage separations applicable to the specific radio service or category of user involved.

* * * * *

19. Section 90.203 is amended by adding a new paragraph (i) to read as follows:

**§ 90.203 Type Acceptance Required.**

* * * * *

(i) Equipment type accepted after February 16, 1988 and marketed for public safety operation in the 821-824/866-869 MHz bands must have the capability to be programmed for operation on the mutual aid channels as designated in § 90.617(a) of the Rules.

20. The frequency table in paragraph (b) of Section 90.205 is amended by revising frequency band "806 to 821" to read "806 to 824" and revising frequency band "851 to 866" to read "851 to 869".

21. Section 90.209 is amended by revising paragraph (b)(4), by redesignating existing paragraphs (i) and (j) as new paragraphs (j) and (k), respectively, and by adding a new paragraph (i) to read as follows:

**§ 90.209 Bandwidth Limitations.**

* * * * *

(b) * * *

(4) For all F3E or G3E emissions on frequencies below 947 MHz, except for the frequency bands 896 to 901 MHz and 935 to 940 MHz, maximum authorized bandwidth shall be 20 kHz. Except for frequencies in the 821-824 and 866- 869 MHz bands, the maximum authorized frequency deviation shall be 5 kHz. For frequencies in the 821-824 and 866-869 MHz bands the maximum authorized frequency deviation shall be 4 kHz. Stations authorized for operation on or before December 1, 1961, in the frequency band 73.0-74.6 MHz may continue to operate with a bandwidth of 40 kHz and a deviation of 15 kHz. For stations operating on frequencies above 947 MHz, except as provided in paragraph (b)(5) of this section, the maximum authorized bandwidth and frequency deviation will be specified in the station authorization.

* * * * *

(i) For transmitters that operate in the frequency bands 821-824 and 866-869 MHz that are not equipped with an audio low-pass filter in accordance with the provisions of 90.211(d)(1), the power of any emission shall be attenuated below the unmodulated carrier power (P) in accordance with the following schedule:

(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of 4 kHz or less: 0 dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 4 kHz up to and including 8.5 kHz: At least 107 log10(fd/4).

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 8.5 kHz up to and including 15 kHz: At least 40.5 log10(fd/1.16).

(4) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 15 kHz up to and including 25 kHz: At least 116 log10(fd/6.1).

(5) On any frequency removed from the center of the authorized bandwidth by more than 25 kHz: At least 43 + log10(output power in watts), or 80 dB, whichever is lesser attenuation.

* * * * *

22. Section 90.211(d) is amended by revising the introductory text and paragraph (d)(1)(ii), and by amending paragraph (d)(2) by changing the reference to "(i)" to read "(j)" in the two places in which it appears to read as follows:

**§ 90.211 Modulation Requirements.**

* * * * *

(d) Each transmitter shall meet the requirements provided in paragraph (d)(1) or (2) of this section. The requirements of this paragraph do not apply to mobile stations that are authorized to operate with a maximum power output of 2 watts or less or to any radiotelecommunication system operating wholly within the limits of one or more of the territories or possessions of the United States, or Alaska, or Hawaii, except those systems operating in the frequency ranges 806 to 824 MHz, 851 to 869 MHz, 896 to 901 MHz, and 935 to 940 MHz.

(1) * * *

(i) * * *

(ii) For transmitters that operate in the frequency band of 450 to 470 MHz and that are authorized on or after November 1, 1967, and transmitters that operate in the frequency bands of 470 to 512 MHz, 806 to 824 MHz, 851 to 869 MHz, 929 to 930 MHz, and Traveler's Information Stations on 530 and 1610 kHz, the attenuation of the low-pass filter between the frequencies of 3 kHz and 20 kHz shall be greater than the attenuation at 1 kHz by at least: 60 Log10 (f/3) decibels where "f" is the frequency in kHz. At frequencies above 20 kHz, the attenuation shall be 50 decibels greater than the attenuation at 1 kHz.

* * * * *

23. Section 90.213 is amended by inserting two lines in numerical order in the Table following paragraph (a) as follows: Section 90.213 Frequency tolerance.

(a) * * *

Frequency Tolerance

| | Fixed and base stations | | Mobile stations | |
|---|---|---|---|---|
| Frequency range (MHz) | 200 W Over output power | 200 W or less output power | Over 2 W output power | 2 W or less output power |
| | | * * * * * | | |
| 821 to 824 | .0001[11] | .0001[11] | .00015 | .00015 |
| | | * * * * * | | |
| 866 to 869 | .0001 | .0001 | .00015 | .00015 |
| | | * * * * * | | |

[11] Control stations may operate with the frequency tolerance specified for associated mobile stations.

* * * * *

24. Section 90.477 is amended by revising paragraph (b) to read as follows:

**§ 90.477 Interconnected Systems.**

* * * * *

(b) In the frequency ranges 806-824 MHz, 851-869 MHz, 896-901 MHz, and 935- 940 MHz, interconnection with the public switched telephone network is authorized under the following conditions:

* * * * *

25. Section 90.492 is revised to read as follows:

§ 90.492 One Way Paging Operations in the 806-824 MHz, 866-869 MHz, 896-901 MHz and 935-940 MHz Bands.

Paging operations are permitted in the 806-824, 851-869, 896-901, and 935-940 MHz bands only in accordance with §§ 90.378 and 90.645(e) and (h).

26. The heading for Part 90, Subpart S, of the Rules and Regulations is revised to read as follows:

Subpart S - Regulations Governing Licensing and Use of Frequencies in the 806-824, 851-869, 896-901, and 935-940 MHz bands.

27. Section 90.601 is revised to read as follows:

**§ 90.601 Scope.**

This subpart sets out the regulations governing the licensing and operations of all conventional systems operating in the 806-824/851-869 MHz and 896-901/935- 940 MHz bands, and trunked systems operating in the 809.750-816/854.750-861 MHz, 821-824/866-869 MHz, and 896-901/935-940 MHz bands. Trunked systems operating in the 816-821/861-866 MHz bands are governed by the rules in Subpart M until action is taken by the Commission to merge Subpart M with Subpart S. This subpart also governs the use of frequencies in the 806-821/851-866 MHz bands along the Mexican and Canadian border areas in accordance with existing agreements. It includes eligibility requirements, applications procedures, operational and technical standards for stations licensed in these bands. The rules in this subpart are to be read in conjunction with the applicable requirements contained elsewhere in this part; however, in case of conflict, the provisions of this subpart shall govern with respect to licensing and operation in these frequency bands.

28. Section 90.603 is amended by revising the introductory text to read as follows:

**§ 90.603 Eligibility.**

The following persons are eligible for licensing in the 806-824 MHz, 851-869 MHz, 896-901 MHz, and 935-940 MHz Bands.

* * * * *

29. The heading immediately preceding Section 90.611 is revised to read as follows:

Policies Governing the Processing of Applications and the Selection and Assignment of Frequencies for Use in the 806-824 MHz, 851-869 MHz, 896-901 MHz, and 935-940 MHz Bands.

30. Section 90.613 is amended by revising the introductory text, and amending the "Table of 806-821/851-866 MHz Channel Designations" by revising the entry for channels 1 and 600 and by adding new channels 601 to 830 to read as follows:

**§ 90.613 Frequencies Available.**

The following table indicates the channel designations of frequencies available for assignment to eligible applicants under this subpart. Frequencies shall be assigned in pairs, with mobile and control station frequencies taken from the 806-824 MHz band with corresponding base station frequencies being 45 MHz higher and taken from the 851-869 MHz band, or with mobile and control station frequencies taken from the 896-901 MHz band with corresponding base station frequencies being 39 MHz higher and taken from the 935-940 MHz band. Only the upper half of each frequency pair is listed in the table.

Table of 806-824/851-869 MHz Channel Designations:

| Channel No. | Base Frequency (MHz) |
|---|---|
| 1 | 851.0125 |
| * * * * * | |
| 600 | 865.9875 |
| 601 | 866.0125 |
| 602 | .0375 |
| 603 | .0500 |
| 604 | .0625 |
| 605 | .0750 |
| 606 | .0875 |
| 607 | .1000 |
| 608 | .1125 |
| 609 | .1250 |
| 610 | .1375 |
| 611 | .1500 |
| 612 | .1625 |
| 613 | .1750 |
| 614 | .1875 |
| 615 | .2000 |
| 616 | .2125 |
| 617 | .2250 |
| 618 | .2375 |
| 619 | .2500 |
| 620 | .2625 |
| 621 | .2750 |
| 622 | .2875 |
| 623 | .3000 |
| 624 | .3125 |
| 625 | .3250 |
| 626 | .3375 |
| 627 | .3500 |
| 628 | .3625 |
| 629 | .3750 |
| 630 | .3875 |
| 631 | .4000 |
| 632 | .4125 |
| 633 | .4250 |
| 634 | .4375 |
| 635 | .4500 |
| 636 | .4625 |
| 637 | .4750 |
| 638 | .4875 |
| 639 | .5125 |
| 640 | .5375 |
| 641 | .5500 |
| 642 | .5625 |
| 643 | .5750 |
| 644 | .5875 |
| 645 | .6000 |
| 646 | .6125 |
| 647 | .6250 |
| 648 | .6375 |
| 649 | .6500 |
| 650 | .6625 |
| 651 | .6750 |
| 652 | .6875 |
| 653 | .7000 |
| 654 | .7125 |
| 655 | .7250 |
| 656 | .7375 |
| 657 | .7500 |
| 658 | .7625 |
| 659 | .7750 |
| 660 | .7875 |
| 661 | .8000 |
| 662 | .8125 |
| 663 | .8250 |
| 664 | .8375 |
| 665 | .8500 |
| 666 | .8625 |
| 667 | .8750 |
| 668 | .8875 |
| 669 | .9000 |
| 670 | .9125 |
| 671 | .9250 |
| 672 | .9375 |
| 673 | .9500 |
| 674 | .9625 |
| 675 | .9750 |
| 676 | .9875 |
| 677 | 867.0125 |
| 678 | .0375 |
| 679 | .0500 |
| 680 | .0625 |
| 681 | .0750 |
| 682 | .0875 |
| 683 | .1000 |
| 684 | .1125 |
| 685 | .1250 |
| 686 | .1375 |
| 687 | .1500 |
| 688 | .1625 |
| 689 | .1750 |
| 690 | .1875 |
| 691 | .2000 |
| 692 | .2125 |
| 693 | .2250 |
| 694 | .2375 |
| 695 | .2500 |
| 696 | .2625 |
| 697 | .2750 |

| | | | |
|---|---|---|---|
| 698 | .2875 | 772 | .2625 |
| 699 | .3000 | 773 | .2750 |
| 700 | .3125 | 774 | .2875 |
| 701 | .3250 | 775 | .3000 |
| 702 | .3375 | 776 | .3125 |
| 703 | .3500 | 777 | .3250 |
| 704 | .3625 | 778 | .3375 |
| 705 | .3750 | 779 | .3500 |
| 706 | .3875 | 780 | .3625 |
| 707 | .4000 | 781 | .3750 |
| 708 | .4125 | 782 | .3875 |
| 709 | .4250 | 783 | .4000 |
| 710 | .4375 | 784 | .4125 |
| 711 | .4500 | 785 | .4250 |
| 712 | .4625 | 786 | .4375 |
| 713 | .4750 | 787 | .4500 |
| 714 | .4875 | 788 | .4625 |
| 715 | .5125 | 789 | .4750 |
| 716 | .5375 | 790 | .4875 |
| 717 | .5500 | 791 | .5000 |
| 718 | .5625 | 792 | .5125 |
| 719 | .5750 | 793 | .5250 |
| 720 | .5875 | 794 | .5375 |
| 721 | .6000 | 795 | .5500 |
| 722 | .6125 | 796 | .5625 |
| 723 | .6250 | 797 | .5750 |
| 724 | .6375 | 798 | .5875 |
| 725 | .6500 | 799 | .6000 |
| 726 | .6625 | 800 | .6125 |
| 727 | .6750 | 801 | .6250 |
| 728 | .6875 | 802 | .6375 |
| 729 | .7000 | 803 | .6500 |
| 730 | .7125 | 804 | .6625 |
| 731 | .7250 | 805 | .6750 |
| 732 | .7375 | 806 | .6875 |
| 733 | .7500 | 807 | .7000 |
| 734 | .7625 | 808 | .7125 |
| 735 | .7750 | 809 | .7250 |
| 736 | .7875 | 810 | .7375 |
| 737 | .8000 | 811 | .7500 |
| 738 | .8125 | 812 | .7625 |
| 739 | .8250 | 813 | .7750 |
| 740 | .8375 | 814 | .7875 |
| 741 | .8500 | 815 | .8000 |
| 742 | .8625 | 816 | .8125 |
| 743 | .8750 | 817 | .8250 |
| 744 | .8875 | 818 | .8375 |
| 745 | .9000 | 819 | .8500 |
| 746 | .9125 | 820 | .8625 |
| 747 | .9250 | 821 | .8750 |
| 748 | .9375 | 822 | .8875 |
| 749 | .9500 | 823 | .9000 |
| 750 | .9625 | 824 | .9125 |
| 751 | .9750 | 825 | .9250 |
| 752 | .9875 | 826 | .9375 |
| 753 | 868.0125 | 827 | .9500 |
| 754 | .0375 | 828 | .9625 |
| 755 | .0500 | 829 | .9725 |
| 756 | .0625 | 830 | .9875 |
| 757 | .0750 | | |
| 758 | .0875 | | |
| 759 | .1000 | | |
| 760 | .1125 | | |
| 761 | .1250 | | |
| 762 | .1375 | | |
| 763 | .1500 | | |
| 764 | .1625 | | |
| 765 | .1750 | | |
| 766 | .1875 | | |
| 767 | .2000 | | |
| 768 | .2125 | | |
| 769 | .2250 | | |
| 770 | .2375 | | |
| 771 | .2500 | | |

* * * * *

31. Section 90.617 is amended by revising the heading, paragraph (a), and the heading of Table 1 following paragraph (a); and by adding new paragraph (a)(1) immediately following Table 1 to read as follows:

§ 90.617 Frequencies in the 809.750-816/854.750-861 MHz, 821-824/866-869 MHz, and 896-901/935-940 MHz Bands Available for Trunked or Conventional System Use in Non-border Areas.

(a) The channels listed in Table 1 and paragraph (a)(1) are available to eligible applicants in the Public Safety Category which consists of the Local Government, Police, Fire, Highway Maintenance, Forestry Conservation, and Special Emergency Radio Services. These frequencies are available in areas farther than 110 km (68.4 miles) from the U.S./Mexican border, and 140 km (87 miles) from the U.S./Canadian border. Specialized Mobile Radio Systems will not be authorized in this category. These channels are available for intercategory sharing as indicated in § 90.621(g).

Public Safety Category

Table 1: 806-821/851-866 MHz Band Channels (70 Channels)

* * * * *

(1) Channels numbers 601-830 are also available to eligible applicants in the Public Safety Category in areas farther than 110 km (68.4 miles) from the U.S./Mexican border, and 140 km (87 miles) from the U.S./Canadian border. The assignment of these channels will be done in accordance with the policies defined in the *Report and Order* of Gen. Docket No. 87-112 (*See* §§ 90.16 and 90.34). The following channels are available only for mutual aid purposes as defined in Gen. Docket No. 87-112: channels 601, 639, 677, 715, 762.

* * * * *

32. Section 90.621 is amended by revising paragraphs (c), (d), and (e); and by adding new paragraph (i) to read as follows:

**§ 90.621 Selection and Assignment of Frequencies.**

* * * * *

(c) Trunked systems authorized on frequencies in the Public Safety (except for those systems that have participated in a formal regional planning process as described in § 90.16), Industrial/Land Transportation, and Business Categories will be protected solely on the basis of predicted contours. Coordinators will attempt to provide a 40 dBu contour and to limit co-channel interference levels to 30 dBu over an applicant's requested service area. This would result in a mileage separation of 70 miles for typical system parameters. Separations will be less than 70 miles where the requested service areas, terrain, or other factors warrant reduction. In the event that the separation is less than 70 miles, the coordinator must indicate that the protection criteria have been preserved or that the affected licensees have agreed in writing to the proposed system. Only co-channel interference between base station operations will be taken into consideration. Adjacent channel and other types of possible interference will not be taken into account.

(d) Conventional systems authorized on frequencies in the Public Safety (except for those systems that have participated in a formal regional planning process as described in § 90.16), Industrial/Land Transportation, and Business Categories that have met the loading level necessary for channel exclusivity will be protected in the same fashion as described above in subparagraph (c).

(e) Conventional systems authorized on frequencies in the Public Safety (except for those systems that have participated in a formal regional planning process as described in § 90.16), Industrial/Land Transportation, and Business Categories that have not met the loading levels necessary for channel exclusivity will not be afforded co-channel protection.

* * * * *

i) Applications for Public Safety systems (both trunked and conventional) in the 821-824/866-869 MHz bands will be assigned and protected based on the criteria established in the appropriate regional plan. *See* § 90.16 and the *Report and Order* in General Docket 87-112.

33. The heading immediately preceding Section 90.635 is revised to read as follows:

Technical Regulations Regarding the Use of Frequencies in the 806-824 MHz, 851-869 MHz, 896-901 MHz, and 935-940 MHz bands.

34. Section 90.635 is amended by revising the titles of Tables 2, 3, and 4 to read as follows:

**§ 90.635 Limitations on Power and Antenna Height.**

* * * * *

Table 2–Equivalent Power and Antenna Heights for Base Stations in the 851-869 MHz, and 935-940 MHz Bands Which Have a Requirement for a 32 km (20 mi.) Service Area Radius.

* * * * *

Table 3–Equivalent Powers and Antenna Heights for Suburban-Conventional Base Stations in the 851-869 MHz. and 935-940 MHz Bands Which Have a Requirement for Less than 20-mi. Service Area Radius-Maximum Effective Radiated Power (Watts).

* * * * *

Table 4–Equivalent Powers and Antenna Heights for Urban-Conventional and Trunked System Base Stations in the 851-869 MHz and 935-940 MHz Bands Which Have a Requirement for Less Than 20-mi. Service Area Radius--Maximum Effective Radiated Power (Watts).

* * * * *

35. Section 90.637 is amended by revising paragraph (a) to read as follows:

§ 90.637 Restrictions on Operational-Fixed Stations.

(a) Except for control stations, operational-fixed operations will not be authorized in the 806-824 MHz, 851-869 MHz, 896-901 MHz, or 935-940 MHz bands. This does not preclude secondary fixed tone signalling and alarm operations authorized in § 90.235.

* * * * *

## FOOTNOTES

[1] Report and Order, Gen. Docket Nos. 84-1231, 84-1233 and 84-1234, 2 FCC Rcd 1825 (1986) (*Allocation Order*), *recon. denied*, 2 FCC Rcd 2515 (1987) (licensing issues), Memorandum Opinion and Order, Gen Docket Nos. 84-1231, 84- 1233, and 84-1234 (adopted September 17, 1987) (allocation issues).

[2] Federal Communications Commission Authorization Act of 1983, Pub. L. No. 98-214, § 9(a), 97 Stat. 1467 (1983) (*Authorization Act*) (directing the Commission to establish a plan that ensures that public safety needs are taken into account in making allocations of the electromagnetic spectrum). In addition, the Conference Report on the Communications Amendments Act of 1982 expressed particular concern about "radio services which are necessary for the safety of life and property and [urged] the Commission to carefully consider the legitimate needs of public safety agencies in managing the private land mobile spectrum." H.R. Rep. No. 97-765, 97th Cong., 2d Sess. 52-53 (1982).

[3] Notice of Proposed Rule Making, Gen. Docket No. 87-112, 2 FCC Rcd 2869 (1987) (*Notice*).

[4] As used in this *Report and Order*, the term "public safety" is intended to include activities of licensees in the Public Safety Radio Services and in the Special Emergency Radio Service. *See* note 13, *infra*.

[5] Notice of Inquiry, Future Public Safety Telecommunications Requirements, PR Docket No. 84-232, 49 Fed. Reg. 9754, 9756-57 (March 15, 1984).

[6] Private Radio Bureau, FCC, Report on Future Public Safety Telecommunications Requirements, PR Docket No. 84-232 (August 1, 1985) (*Staff Report*), *released by* Order Regarding Staff Report, Future Public Safety Telecommunications Requirements, 50 Fed. Reg. 32239 (August 9, 1985).

[7] The Report pointed out that these frequencies would be extremely useful for public safety purposes because they are adjacent to existing public safety allocations. *Staff Report* at 108. Public safety authorities who commented on the *Notice* also advocated allocation of this portion of the spectrum for public safety use. *See Allocation Order*, 2 FCC Rcd at 1837, para. 90.

[8] *Id.* at 1837, para. 90. First Report and Order and Second Notice of Inquiry, Gen. Docket No. 18262, 35 Fed. Reg. 8644 (June 4, 1970).

[9] Charter of the National Public Safety Planning Advisory Committee, Section C, *published in* Appendix A, Notice of Proposed Rule Making, Gen. Docket No. 87-112, 2 FCC Rcd 2869, 2873 (1987).

[10] NPSPAC, Initial Report To The Federal Communications Commission, *published in* Appendix B, Notice of Proposed Rule Making, Gen. Docket No. 87-112, 2 FCC Rcd 2869, 2873-92 (1987) (*Initial Report*).

[11] Final Report of the National Public Safety Planning Advisory Committee to the Federal Communications Commission, Gen. Docket No. 87-112 (September 9, 1987) (*Final Report*). The NPSPAC membership adopted the *Final Report* unanimously.

[12] FCC, Public Notice, Comments Requested on Final Report of the National Public Safety Planning Advisory Committee, Report No. 4810 (September 11, 1987). *See* Appendix A of this Report and Order for a complete list of parties filing comments on the *Notice*, *Initial Report*, and *Final Report*.

[13] The Public Safety Radio Services include local governments, police and fire departments, and highway maintenance and forestry-conservation entities. 47 C.F.R. Part 90, Subpart B, §§ 90.15 - 90.25. The Special Emergency Radio Service (SERS) includes hospitals, clinics, physicians, rescue organizations, medical service agencies, veterinarians, handicapped persons, disaster relief organizations, school buses, beach patrols, and additional emergency services. 47 C.F.R. Part 90, Subpart C, §§ 90.33 - 90.55.

[14] Because 12.5 kHz is half the channel width traditionally used at 800 MHz, this plan is commonly referred to as the "split channel" plan.

[15] Specifically, NPSPAC recommended that the 821-824/866-869 MHz spectrum be authorized in 25 kHz bandwidth channels evenly spaced every 12.5 kHz, except that national common or mutual aid channels should have no 12.5 kHz adjacent frequency assignments; that equipment employing 25 kHz bandwidth be allowed on all channels, with 12.5 kHz adjacent systems being configured in an offset arrangment with due consideration given to both protection ratios and frequency reuse criteria; that there be no distinctions between the "primary and "offset" channels, such as power output and antenna height limitations (*i. e.*, no secondary use rules should be applied); that the enhanced 25 kHz bandwidth equipment be required for all users, but that future migration to more advanced technologies be neither required nor prohibited at this time; and that the above recommendations, insofar as they are applicable, be also implemented in the 806-821/851-866 MHz public safety allocation, with provisions for easing adverse impact on existing systems in the public safety "pool." *Final Report* at 17-18.

[16] *Final Report* at 16, *citing* Motorola C&E, Inc., Comparison of Spectrum Efficiency of 25 kHz Offset Channel and 12.5 kHz Split Channel Approaches to the 821-824 MHz Public Safety Spectrum (technical paper presented to Electronics Industries Ass'n, Land Mobile Section, July 24, 1987).

[17] NPSPAC recommends the following improvements to the existing equipment specifications:

a. Reduce deviation of all transmitters to 4.0 kHz;

b. Improve all mobile, portable and control transmitter frequency stability to .00015% and .0001% for base transmitters;

c. Improve the receiver selectivity so as to provide 20 dB of protection to the 12.5 kHz removed signal when tested in accordance with a revised method of measurement for voice modulation; and

d. For data, employ a "data mask" with the following attenuation characteristics:

| | |
|---|---|
| 0 to 4.0 kHz | 0 dB |
| 4 to 8.5 kHz | 107 Log10 (f/4) |
| 8.5 to 15.0 kHz | 40.5 Log10 (f/1.16) |
| 15.0 to 25.0 kHz | 116 Log10 (f/6.1) |
| Greater than 25.0 kHz | 43.0 Log10 (power output in watts), or 80 dB, whichever is the lesser attenuation |

NPSPAC noted that these modifications were developed with the assistance and consensus of radio equipment manufacturers, consulting engineers and public safety agencies, utilizing field tests and bench tests. *Final Report* at 8.

[18] An inferior receiver would, of course, diminish a public safety organization's ability to receive communications and, thus, its ability to provide public safety services. We believe, however, that these organizations have incentives to use technologically adequate receivers.

[19] The specific national common channels recommended by NPSPAC are as follows:

| CHANNEL | USE |
|---|---|
| 1. 821.0125 (M)<br>866.0125 (B) | National Public Safety Calling Channel |
| 2. 821.5125 (M)<br>866.5125 (B) | Tactical Channel |
| 3. 822.0125 (M)<br>867.0125 (B) | Tactical Channel |
| 4. 822.5125 (M)<br>867.5125 (B) | Tactical Channel |
| 5. 823.0125 (M)<br>868.0125 (B) | Tactical Channel |

*Final Report* at 6.

[20] We recognize that many agencies currently coordinate their activities by wireline or other arrangements. These existing arrangements, however, would not provide the same capabilities as the intercommunication channels we are establishing here. These channels will serve as a central network that all public safety entities participating in the National Plan will have in common.

[21] Equipment that is type accepted for operation in the 806-821/851-866 MHz bands may not be modified to operate in the newly allocated spectrum at 821- 824/866-869 MHz unless it is type accepted as conforming to the revised technical standards adopted herein. One exception to this policy will be permitted: equipment type accepted under Part 90 for operation in the 806-821/851-866 MHz band is considered type accepted for operation on the five mutual aid channels.

[22] 47 C.F.R. §§ 90.631 and 90.633.

[23] The regions recommended by NPSPAC are as follows:

1. Alabama; 2. Alaska; 3. Arizona; 4. Arkansas; 5. California (Northern); 6. California (Southern); 7. Colorado; 8. Connecticut (Western) - New York (Southern) - New Jersey (Northern); 9. Florida; 10. Georgia; 11. Hawaii; 12. Idaho; 13. Illinois; 14. Illinois (Northeastern) - Wisconsin (Southeastern) - Indiana (Northwestern) - Michigan (Southwestern); 15. Illinois (Northwestern) - Wisconsin (Southwestern); 16. Indiana; 17. Iowa; 18. Kansas; 19. Kentucky; 20. Louisiana; 21. Maine - New Hampshire - Vermont - Massachusetts - Rhode Island - Connecticut (Northern); 22. Maryland - Washington, D.C. - Virginia (Northern); 23. Michigan; 24. Minnesota; 25. Mississippi; 26. Missouri; 27. Montana; 28. Nebraska; 29. Nevada; 30. New Jersey (Southern) - Pennsylvania (Eastern) - Delaware; 31. New Mexico; 32. New York - Albany; 33. New York - Buffalo; 34. North Carolina; 35. North Dakota; 36. Ohio; 37. Oklahoma; 38. Oregon; 39. Pennsylvania; 40. South Carolina; 41. South Dakota; 42. Tennessee; 43. Texas - Austin; 44. Texas - Dallas/Forth Worth; 45 Texas - El Paso; 46. Texas - Houston; 47. Texas - Lubbock/Amarillo; 48. Texas - San Antonio; 49. Utah; 50. Virginia; 51. Washington; 52. West Virginia; 53. Wisconsin; and 54 Wyoming. *Final Report* at 28-29.

[24] As indicated in the *Notice*, in some areas such as Southern California, the New York Metropolitan area, and Dallas, local public safety groups have already formed to establish regional plans for public safety use of the radio spectrum in their immediate areas. *Notice*, 2 FCC Rcd at 2870, para. 7.

[25] *See*, *e. g.*, Comments of South Carolina at 2-3; Comments of Florida Division of Communications at 3.

[26] This issue may also, of course, be raised in a petition for reconsideration of this Order.

[27] NPSPAC asserts that its proposal endorses a Commission proposal to limit the regional planning process to governmental entities. *Final Report* at 29. By the term "public safety authorities" in the *Notice*, we included all entities eligible to be licensed in the Public Safety and Special Emergency Radio Services, not just governmental entities. *Notice*, 2 FCC Rcd at 2869, para. 6.

[28] The *Notice* proposed to make APCO the frequency coordinator for the new public safety spectrum. *Notice*, 2 FCC Rcd at 2871, para. 21. No objections were raised to this proposal. It is thus adopted, based on APCO's considerable experience and resources as coordinator for the Public Safety Radio Services.

[29] The Commission's Office of Engineering and Technology is making available a computer program that can be used as an aid to maximize spectrum utilization in developing regional plans. The program is designed to determine the optimum frequency assignment scheme that will maximize reuse, taking into account transmitter location and priorities in making channel assignments. Other methods or computer programs may be used to achieve efficient spectrum utilization.

[30] We strongly encourage regional planning groups to refer to NPSPAC's *Final Report* for useful information on preparation of regional plans. Copies of the *Final Report* are available from the FCC's duplication contractor, International Transcription Services, Inc., Suite 140, 2100 M Street, N.W., Washington, D.C. 20037, (202) 857-3800.

[31] According to the *Final Report*, at present, vacated frequencies in congested areas are, as a practical matter, reassigned by regional coordinators to other public safety entities. Local public safety organizations cooperate in this process by keeping each other informed of the need for additional frequencies and the potential for abandoning use of an existing assignment. *Final Report* at 48.

[32] NTIA Comments at 2. *See* Letter from Edward J. Minkel to Alfred C. Sikes (Dec. 18, 1986); Letter from Edward J. Minkel to Lieutenant General Winston D. Powers (Nov. 28, 1986).

## SEPARATE STATEMENT OF COMMISSIONER JAMES H. QUELLO DISSENTING IN PART AND CONCURRING IN PART

Re: Development and Implementation of a Public Safety National Plan, an Amendment of Part 90 to Establish Service Rules and Technical Standards for Use of the 821-824/866-869 MHz Bands by the Public Safety Service.

I am dissenting in part to the majority's decision in this proceeding based on the fact that the public has not had the opportunity to comment on the Commission's deter-